U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Hazardia orcuttii* (A. Gray) E. Greene

COMMON NAME: Orcutt's Hazardia, (Orcutt's brittleweed, Orcutt's goldenbush)

LEAD REGION: Region 8

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
_X__ Petitioned - Date petition received: March 8, 2001
__ 90-day positive - FR date:
__ 12-month warranted but precluded - FR date:
__ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

___ Listing priority change
Former LP: ___
New LP: __

Date when the species first became a Candidate (as currently defined): May 4, 2004 (69 FR 24880).

___ Candidate removal: Former LPN: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."
___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY**:** Flowering plants, Asteraceae (sunflower family).

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California, U.S.A. and Estado de Baja California, Mexico.

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:
San Diego County, California, U.S.A. and Baja California, Mexico.

LAND OWNERSHIP: All private. The only known extant native occurrence of this species in the United States is in the Manchester Conservation Area (MCA) (previously known as the Manchester Mitigation Bank) now managed by the Center for Natural Lands Management (CNLM). Within the conservation area, the native population of *Hazardia orcuttii* is confined to approximately 2 hectares (ha) (5 acres (ac)).

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BIOLOGICAL INFORMATION

Species Description

Hazardia orcuttii is an evergreen shrubby species in the Asteraceae (sunflower family). The resinous shrubs are 50–100 centimeters (cm) (20–40 inches (in)) high and the relatively few branches are erect. The sessile leaves are spathulate to lanceolate with entire margins, and up to 5 cm (2 in) long. Leaf surfaces have resinous surface glands and are glabrous. The flower heads

have involucre bracts with entire margins and fertile disk flowers. The ray flowers are conspicuous, blooming from August to February (Vourlitis *et al.* 2006, p. 32). This species is distinguished from the other *Hazardia* species in the area, *H. squarrosa*, which lacks conspicuous ray flowers and has toothed leaf margins.

Taxonomy

Hazardia orcuttii was first described as *Haplopappus orcuttii* by Asa Gray (1885, p. 297) based on material collected by Charles R. Orcutt in September 1884 at Todos Santos Bay in Baja California, Mexico. Subsequently, Greene (1894, p. 112) published the currently accepted combination *Hazardia orcuttii* (A. Gray) E. Greene in recognition of the significant differences among several groups of *Haplopappus*. However, Hall (1928, p. 248) included this species in section Hazardia of the genus *Haplopappus*. Clark (1979, pp. 105–127) published a taxonomic treatment of the genus *Hazardia* in which he recognized the combination originally proposed by Greene. This has been followed in floristic treatments since that time (Beauchamp 1986, p. 106; Brown and Clark 1993, pp. 275–276). We reviewed the available information and concurred with this taxonomic treatment.

Habitat/Life History

The only known native occurrence of *Hazardia orcuttii* in the United States is in coastal San Diego County, California at MCA, now managed by CNLM. The area is approximately 50 ha (123 ac) and includes Diegan coastal sage scrub, southern maritime chaparral, and willow scrub (CNLM 2000, p. 1, 2003, p. 1; Burrascano 2001, p. 6). Low seed germination rates have been thought to pose a problem for the species (Burrascano 2001, p. 7). Vourlitis *et al.* (2006, p. 29) found that of the seeds actually produced, only 6 percent were viable while insects or fungal agents damaged approximately 50 percent. There was a very limited soil seed bank observed at MCA (Vourlitis *et al.* 2006, p. 62). Any factors that limit the reproductive output may limit the establishment of plants to replace older individuals in the population. MCA also supports populations of federally listed California gnatcatcher (*Polioptila californica californica*), *Arctostaphylos glandulosa* subsp. *crassifolia* (Del Mar Manzanita), and *Acanthomintha ilicifolia* (San Diego thornmint). The general substrate for the *H. orcuttii* is sandstone.

Historical Range/Distribution

Oberbauer (1981, p. 38) discovered the only occurrence of this species in the United States (now in MCA, described above) in August 1979, 95 years after the species was first described from specimens from Mexico. He estimated there were several hundred individuals at the site (referred to as the native site throughout this document) and indicated the species had not been included in the environmental impact report for the area, which subsequently was approved for development.

In Baja California, Mexico, the species was collected historically from scattered localities near the coast extending from the United States/Mexico border south to Colonet Mesa. Burrascano (2001, pp. 11–12) listed 17 localities for *Hazardia orcuttii* based on herbarium specimens, the

most recent collected in 1985.

Current Range/Distribution

The only known extant U.S. native occurrence of this species is on the southwest corner of MCA, in Encinitas (northwestern San Diego County), California (Figure 1). Approximately half of the occurrence was destroyed in 1984 (Burrascano 2001, p. 7) and about 300 plants were seen in 1988 (CNDDB 2009, Element Occurrence (EO) 1). In 2006, 668 adults and 47 seedlings were detected at the native site (J. Vinje, pers. comm. 2010). Five additional occurrences, considered here to support test populations of *Hazardia orcuttii*, were established by CNLM since 2003: one at MCA; two on other CNLM preserves in the vicinity (Rancho La Costa and Kelly Ranch); one at San Elijo Lagoon, managed by California Department of Fish and Game (CDFG) and the County of San Diego; and in 2005, an occurrence was established at San Diego Botanic Garden (SDBG) (formerly Quail Botanical Gardens).

Kirker (2005, *in litt.* pp. 1–3) verified the persistence of the species at several sites in northern Baja California, Mexico. This area continues to be developed, resulting in associated habitat loss and degradation.

Population Estimates/Status

The native occurrence at MCA may have supported a population of approximately 700 plants until 1984, when about half the occurrence was reportedly destroyed for a housing development (Burrascano 2001, p. 7). The occurrence supported approximately 300 adult plants in 1988, 250 adults in 1996, 350 adults in 2000, and 598 adults in 2001 with the increase in 2001 attributed to a more thorough survey (CNDDB 2009, EO 1; CNLM 2000, p. 8; CNLM 2003, p. 14). The 598 adults found in 2001 included 70 surviving plants from an unauthorized translocation of 200 adult plants to the site from an adjacent property in 1999; the number of surviving transplants was revised to 53 adults in 2003 (CNLM 2003, p. 11). This indicates that approximately 73 percent of the 200 plants translocated to the site in 1999 died by 2003 (CNLM 2003, p. 11). In 2006, 668 adults and 47 seedlings were counted at the native site; none of the seedlings were associated with the unauthorized transplants (CNLM 2007a, p. 13). No seedlings have been reported at the native occurrence since that time, although surveys were not performed annually and when done may have differed in rigor (CNLM 2008, p. 9). The general trend at the native occurrence is one of increasing numbers of individuals (CNLM 2008 p. 9). No quantitative information is available for 2009, though casual monitoring of the site indicates that the native population is stable (Vinje, pers. comm. 2010). That would indicate that there are potentially 715 plants if none had died since 2006 (668 adults plus 47 seedlings).

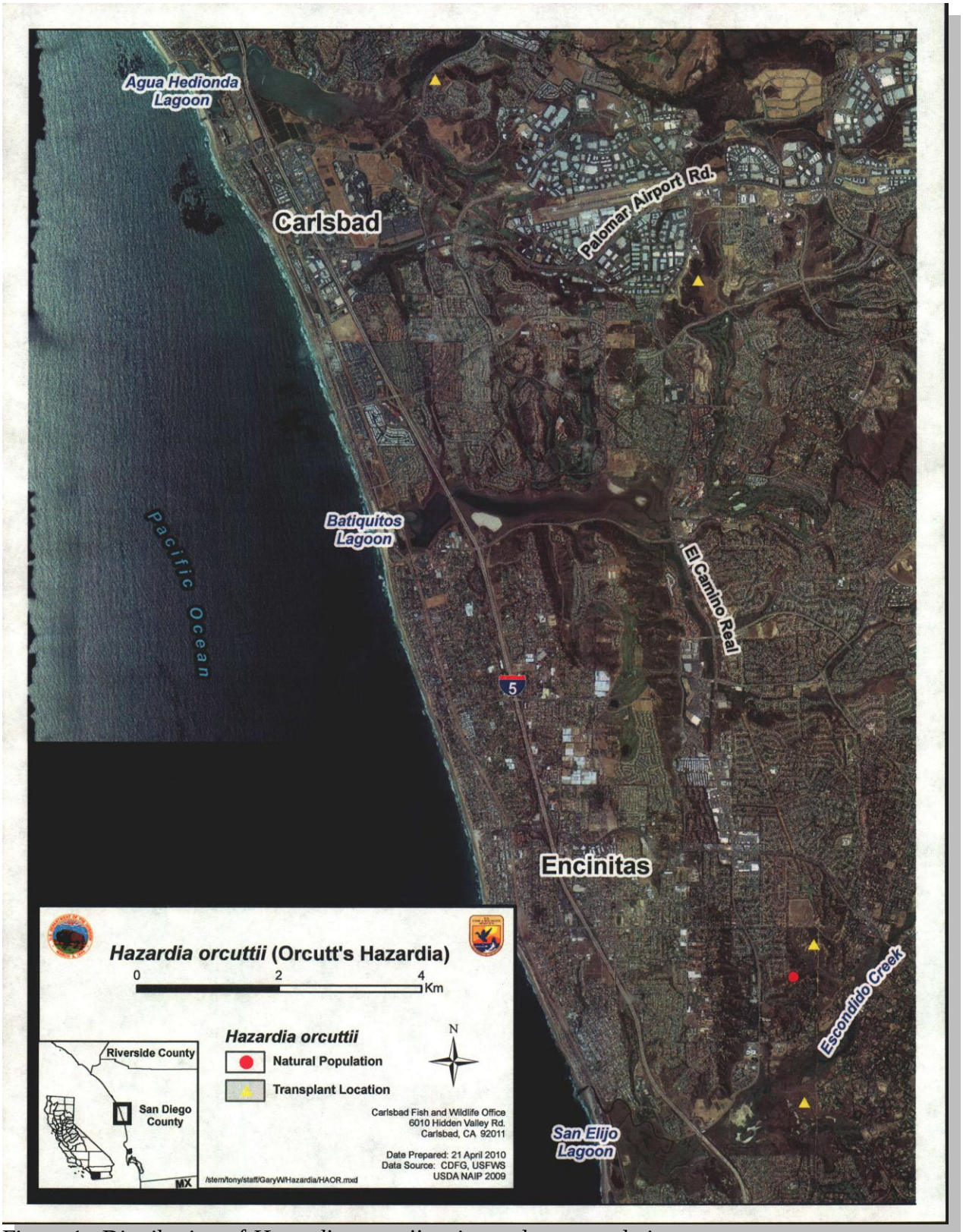

Figure 1: Distribution of *Hazardia orcuttii* native and test populations.

In 2003, a test population consisting of 200 *Hazardia orcuttii* plants was planted on the northeastern mesa of MCA (also referred to as the northern population (CNLM 2006, p. 13). These were planted on soils that are different from the soil at the native occurrence and some distance away from the native occurrence in MCA (CNLM, 2005, p. 9). According to CNLM (2004, p. 1), CDFG approved these out-plantings. The plants were propagated from seed collections from the native population (CNLM 2005, p. 9). In 2004, 146 plants were counted, and many were flowering (CNLM 2005, p. 10). However, no recruitment was noted at this site until 2006 when 183 adults and 14 seedlings were found (CNLM 2007a, p. 13). The apparent difference in the number of adult plants may be attributed to previously undetected reproduction of the original 200 plants. In 2007, 102 approximately one to two-year-old seedlings were counted (CNLM 2007a, p. 10). No surveys of adult *H. orcuttii* were conducted in 2007. In 2008, 104 living 1 to 3-year-old seedlings were counted; however, adults were not counted that year. In 2009, 186 approximately one to four-year-old seedlings were counted (CNLM 2009a, p. 7). Adults were not counted in 2009; however, two plants identified as former seedlings were seen flowering (Vinje, pers. comm. 2010). This indicates that 4-year old plants are capable of flowering. Surveyors can easily distinguish transplanted plants from growing seedlings, either because they are marked (flagged) or because of their spatial locality (Vinje, pers. comm. 2010). If no mortality of adults has occurred since 2006, then the population size is presumably 371 plants (185 adults plus 186 seedlings). The biotic interaction of the specimens planted out in 2003 with those of the native site is unknown. The northern population is considered especially important to the long-term sustainability of the species because transplants are setting viable seed and seeds are becoming established (CNLM 2007a, p. 13).

Three additional test populations were established by CNLM on other preserves near MCA. Twenty-five plants were established at Kelly Ranch Habitat Conservation Area, managed by CNLM, in January 2003. Of these, four died within the first two weeks (M. Spiegelberg 2004, *in litt.* p. 1). An additional 100 plants were planted in February 2004. By the summer of 2005, 97 adult plants had survived and no seedlings were reported. In 2006, 104 adult plants were counted (CNLM 2007b, p. 6). In 2007, 106 adult plants and 3 seedlings were counted; this was the first year seedlings were identified (CNLM 2007b, p. 6). One seedling was most likely present in 2006 but overlooked during survey efforts, as it appeared to be at least a year old when observed in 2007. In 2008, 100 adults and 16 seedlings were counted (CNLM 2009a, p. 1); a thorough survey in 2009 indicated that this figure was in error (CNLM 2009b, p. 6). In 2009, 104 adults and 110 live seedlings were counted (CNLM 2009b, p. 6). The habitat conditions at this location are similar to those found at the native site (CNLM 2009b).

In 2004, 200 plants were established at the Rancho La Costa Habitat Conservation Area, managed by CNLM. In 2006, 160 adult plants were counted. In 2009, 156 adult plants were counted (CNLM 2010, p.1). This population appears to be declining as there are fewer adults annually and there is no indication of seedling recruitment.

Also in 2004, 156 plants were established at San Elijo Lagoon (M. Spiegelberg, pers. comm. 2010); approximately 50 percent of those planted at San Elijo Lagoon died by the following year (CNLM 2005, p. 10). In 2006, 58 adult plants were counted and in 2009, 40 adult plants were

counted (CNLM 2010, p. 2). This population is also in decline and seedling recruitment has not been observed. Management of this site is the responsibility of CDFG; however, population monitoring has been performed by CNLM. CNLM has planned surveys of all of the above populations for mid-April in 2010 (Vinje, pers. comm. 2010).

A fifth test population was established in the fall of 2005 at SDBG on soil brought from the site of the native population. The garden obtained about 32 individuals from California State University San Marcos, which had obtained the plants from the initial propagation in 2003 (D. Ehrlinger, pers. comm. 2010). Some plants were in poor condition and died prior to planting. A total of 25 individuals were planted out, two or three of which subsequently died (Ehrlinger, pers. comm. 2010). In July 2009, 23 adults were reported from this site, 22 of which were in one area, and one was isolated but nearby. There were five living seedlings in 2009 (Vinje, pers. comm. 2010). This population appears to be doing well as plants are not watered and seedling recruitment is occurring.

All outplanted plants were propagated from seed collected from the native population. The actual or potential interaction of plants at occurrences supporting test populations with those at the only known native site at MCA is unknown. The outplanted populations of *Hazardia orcuttii* at Kelly Ranch, Rancho La Costa, San Elijo lagoon, and SDBG are wholly separate geographically from the native population at MCA. The onsite out-planting installed some distance away from or on soil different from those at the native site, (Spiegelberg, pers. comm. 2010) also constitute a test population.

Seedlings have been observed clustered around adults (Vinje, pers. comm. 2010). A study initiated by CNLM to determine if there is a significant relationship between the potential parent plant and the location of seedling revealed that 73 percent of all seedlings were clustered around seven obvious parent plants (CNLM 2009a, p. 8). Seedlings were growing in areas with little litter (dry, nonnative grasses and forbs) (CNLM 2009a, p. 8).

Kirker (2005, *in litt.* p. 1) visited 15 of the 17 known occurrences of the *Hazardia orcuttii* in Mexico that were mentioned in Burrascano's (2001, pp. 11–12) petition. Many of the sites had not been verified for some time. Kirker made the following observations: one site description was too vague to locate; five sites (including two considered to be the same place) had no plants; six sites had "a couple dozen" or fewer plants; one site south of Rio Guadalupe had 50 plants; one site at Jatay had 300 to 400 *H. orcuttii* plants; and one site at Punta Banda had 750 plants (Kirker 2005, *in litt.* pp. 1–5). Additionally, Kirker noted that the owner of the Jatay site intended to develop the area. Kirker revisited the Jatay site in 2007 and noted that approximately 50 percent of the population was cleared for a building site (Kirker 2007, *in litt.* p. 1).

In summary, the estimated total number of *Hazardia orcuttii* plants at the native occurrence was approximately 668 adults and 47 seedlings in the United States as of 2006, and approximately 1,300 plants at three sites in northern Baja California, Mexico. There are an additional five test populations derived from material from the native population that collectively support approximately 500 adult plants and 350 seedlings. The test populations at the Rancho La Costa

Habitat Conservation Area and the San Elijo Ecological Reserve both appear to be in decline and have not been shown to support seedlings while the other three test populations support each support seedling cohorts.

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Clark (1979, pp. 117–118) described *Hazardia orcuttii* as being locally common in open habitats along the coastal plains and hills in Baja California, Mexico from Colonet to Tijuana. Anecdotal observations that the species' habitat in Mexico is being developed for housing at a rapid pace are borne out by site descriptions by Kirker (2005, *in litt.* pp. 2–4). *Hazardia orcuttii* has no conservation standing in Mexico.

The majority of the remaining *Hazardia orcuttii* population in the United States at Encinitas was included in the Manchester Mitigation Bank (now called the Manchester Conservation Area) in the mid 1990s and is managed by CNLM. The habitat is protected from direct development, though remains threatened by human impacts because the area is utilized for recreation. Impacts include pedestrian trampling, on and off-leash dogs, and creation of bicycle trails near *H. orcuttii* plants. Near the public entrance access, the soils appear more compacted and fouled with animal droppings; however, habitat conditions improve away from the entrance point. Many trails going to the native population have been closed (Vinje, pers. comm. 2010) and bicycle trails and jumps have been excavated on the site within the native population area.

Contrary to the management guidelines (and without the consent of CNLM), the Encinitas Fire Department cleared habitat on the site for training purposes in October 2000, and although we know that some of the previously-occupied habitat no longer supports these plants, it is unknown how many plants were impacted.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Not known to be a factor at this time.

C. Disease or predation.

Vourlitis *et al.* (2006, p. 35) found that 95 percent of the flowers examined at the native population site were damaged by insects or fungal agents, or aborted prematurely and that only 6 percent of the seeds actually produced were viable; additionally, insects or fungal agents damaged 50 percent of the seeds produced. The significance of these observations is unknown because a thorough survey of plants at the native site has not been conducted since 2006 (Vinje, pers. comm. 2010). Cursory observations have indicated that the native site is stable and the plant population is increasing; however, if these conditions persist as threats in future years, they could prove to be a significant determinant to reproductive output. These factors may contribute to the decline of the population numbers as older plants die as well as to a decrease in genetic diversity of *Hazardia orcuttii*.

D. The inadequacy of existing regulatory mechanisms.

Hazardia orcuttii is included as a List 1B plant (rare, threatened, or endangered in California and elsewhere) in the most recent edition of the California Native Plant Society's (CNPS) Inventory (CNPS 2001, p. 180). California Environmental Quality Act (CEQA) obligates disclosure of environmental resources within proposed project areas and may enhance opportunities for conservation efforts. However, CEQA does not guarantee that such conservation efforts will be implemented. Protection of any species through CEQA is dependent upon the level of concern expressed by the public, local, State, and Federal agencies involvement, and the discretion of the lead agency involved.

Hazardia orcuttii was listed by the State as threatened in August 2002. The California Endangered Species Act (CESA)(Division 3, chapter 1.5, section 2050 *et seq.* of the California Fish and Game (CFG) code) enacted in 1984, and the Native Plant Protection Act (NPPA) (Division 2, chapter 10, section 1900 *et seq.* of the CFG code) enacted in 1977, provide some protection for this species. Both NPPA and CESA include prohibitions forbidding the "take" of *H. orcuttii* (Chapter 10, Section 1908 and Chapter 1.5, Section 2080, CFG code). However, sections 2081(b) and (c) of CESA allow CDFG to issue incidental take permits for State-listed threatened and endangered species if:

1) The authorized take is incidental to an otherwise lawful activity;
2) the impacts of the authorized take are minimized and fully mitigated;
3) the measures required to minimize and fully mitigate the impacts of the authorized take are roughly proportional in extent to the impact of the taking on the species, maintain the applicant's objectives to the greatest extent possible, and are capable of successful implementation;
4) adequate funding is provided to implement the required minimization and mitigation measures and to monitor compliance with and the effectiveness of the measures; and
5) issuance of the permit will not jeopardize the continued existence of a State-listed species.

MCA was set aside in 1997 for the preservation or protection of maritime chaparral, coastal sage scrub, and California coastal gnatcatchers. The site is currently managed by CNLM.

The Multiple Habitat Conservation Plan (MHCP) for northern areas of San Diego County includes species covered by the City of Encinitas, including *Hazardia orcuttii* (AMEC 2003a, p. 3-9). This MHCP was developed in accordance with provisions of the Federal Endangered Species Act, as amended (Act). Conservation measures intended for this species are outlined in the MHCP (AMEC 2003b, pp. 4-111–4-112). Under the MHCP, all major populations and critical locations of *H. orcuttii*, along with enough suitable habitat to sustain pollen and seed vectors, will be conserved and managed (AMEC 2003b, p. 4-111). The MHCP states that the plan will adequately preserve the species by conserving 97 percent of the known location points, major populations, and critical locations, and provide protection to the species by application of the narrow endemic policy that requires avoidance of impacts to narrow endemics to the

maximum extent practicable (AMEC 2003b, pp. 4-111–4-112). The City of Encinitas will not allow more than a 5 percent loss of populations or occupied acreage within the Focused Planning Area (AMEC 2003a, p. 3-30). However, the conservation provisions of the MHCP for the known *H. orcuttii* occurrence will not take effect until the United States Fish and Wildlife Service (Service) issues a permit to the City of Encinitas, based on their MHCP Subarea Plan.

The San Diego County Water Authority may also include *Hazardia orcuttii* as a covered species in their draft Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) that is currently under development (Crowell, pers. comm. 2008). This species may potentially occur within a right-of-way in their Plan Area. Specific conservation and minimization measures are not yet available.

Contrary to the guidance of MHCP to avoid impacts to narrow endemics, in 1999, the owner of an adjacent parcel moved approximately 200 *Hazardia orcuttii* plants from his property to MCA without the knowledge of CNLM. According to CNLM (2000, p. 8), approximately 70 of these individuals were still alive months later; only 53 were alive in 2003 (CNLM 2003, p. 11). Under the MHCP agreement (AMEC 2003b, p. 4-111), 97 percent of the known location points, major populations, and critical locations for this species were to be conserved. It is evident that there were at least 200 plants outside of that protected area. At the time, MCA reportedly supported approximately 300 plants (CNDDB 1997, EO 1). Therefore, it appears that only 60 percent of the plants were within the protected area now called MCA. Burrascano (2001, p. 8) cites a communication from the City of Encinitas stating that they could do nothing about the plant removal [transplantation] because the species was not federally or State listed. The species is now listed as threatened by the State of California; therefore, it is not likely that similar incidents will occur in the future. However, it may prove important to be able to track these lineages for recovery actions for the species.

In summary, active management of the extant native occurrence will always be necessary because of the surrounding development and access issues. Existing regulatory mechanisms provide some protections to the habitat occupied by *Hazardia orcuttiana* and management provisions for the species under the MHCP will remain in place even if the species is not listed. Federal status could attract additional support for actions to ensure natural persistence and success of this species.

E. Other natural or manmade factors affecting its continued existence.

Other existing and potential threats to *Hazardia orcuttii* in the United States include impacts associated with invasive nonnative plants and small population size.

Invasive nonnative plants may pose a threat to the reproductive output of *Hazardia orcuttii* plants by limiting resources (such as space, nutrients, or light). Actions taken to reduce nonnative plants are included in Table 2 in the 2008 CNLM Annual Report (CNLM 2008, pp. 14–15). The native occurrence does not appear threatened by invasive nonnative plants at this time (Vinje, pers. comm. 2010).

Small populations are vulnerable to extirpation by demographic, environmental, and genetic stochasticity, and natural catastrophes (Shaffer 1981). Demographic stochasticity is random variability in survival or reproduction among individuals within a population (Shaffer 1981), and could play a role in the extirpation of the single native population of *Hazardia orcuttii*. The native populations is known to have produced a cohort of seedlings only once. Environmental stochasticity refers to annual variation in birth and death rates in response to weather, disease, competition, predation, or other factors external to the population (Shaffer 1981). This could play a role in extirpation of the small native population, located in a single small area. Genetic stochasticity results from changes in gene frequencies due to founder effect, random fixation, or inbreeding (Shaffer 1981). The low levels of genetic variation within population could impair the species' ability to adapt to changes in the environment or contribute to inbreeding depression (i.e., loss of reproductive fitness or vigor). Natural catastrophes such as regional fires similar to those in San Diego County in recent years, or prolonged drought could result in extirpation of some portion of the native population (Shaffer 1981). The entire native range of *Hazardia orcuttii* in the United States encompasses an area of about 2 hectares (5 acres) therefore; any regional fire would be a range wide impact.

Conditions that potentially exacerbate the threats associated with small population size include the species limited range in the United States, low reproductive output, and genetic factors. *Hazardia orcuttii* naturally exists from a single, small, native population, distributed in one area of MCA in San Diego County, California. The recruitment rate of the native population may be low and insufficient to provide for the long-term replacement of the native population individuals. As noted above, in one study, only 6 percent of the seeds produced were viable, a significant percentage of the flowers were damaged by insects or fungal agents, and only one cohort of seedlings has been found at the native occurrence. Genetic factors such as self-incompatibility may also pose a threat to the species in that the condition places genetic constraints on the breeding potential of standing plants generally favoring larger populations.

The impacts associated with the test populations of *Hazardia orcuttii* on the native occurrence and the species as a whole in the United States are unknown. They may pose potential threats to the genetic structure and function of the native *Hazardia orcuttii* population. We have no information on the interactions of the test and native populations. The test populations do provide more sites where the species is present, support additional adult plants, and each of three of the test populations have produced at least one cohort of seedlings. The impacts and conservation potential of the test populations is unmeasured.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

As noted above, the MHCP for northern areas of San Diego County includes species covered by the City of Encinitas, including *Hazardia orcuttii* (AMEC 2003a, p. 3-9). The Manchester Conservation Area (MCA) (managed by CNLM) includes the following management activities: signage, fence maintenance, monitoring and habitat restoration, and public services. The area is patrolled two to four times each month to assess trespass and management needs (CNLM 2002, p. 5). The CNLM has also received a grant from the City of Encinitas for trail maintenance, signage, fencing, and erosion control. These activities likely will contribute to reducing impacts

to *Hazardia orcuttii* at the native site.

SUMMARY OF THREATS

Most of the threats to this species relate to small population size and factors that may contribute or exacerbate this threat. Additional threats associated with recreational use of the occurrence site and seed predation are noted above. This species is known from a single native population of fewer than 1,000 individuals in a small area. Consequently, this occurrence could readily be extirpated by a regional fire such as those that have occurred in the area in the past 10 years. The estimated total number of *Hazardia orcuttii* plants at the native occurrence was approximately 668 adults and 47 seedlings in the United States as of 2006. *Hazardia orcuttii* plants have an apparently low seed set and viability. Only 47 seedlings found in a single year have been recorded from the native site and their persistence has not been determined. This may not be enough to replace and sustain the native population as older plants die. The conservation value of the test populations has yet to be determined. We find that *H. orcuttii* is warranted for listing throughout all its range; therefore, we find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

n/a Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES

It is recommended that research be undertaken that identifies the nature and adequacy of reproductive output for this species as well as any necessary remediation. The degree and adequacy of genetic diversity of the species' native population should be determined. Assess the conservation value of the test populations.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5*
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: Hazardia orcuttii faces a high magnitude of threat because of the relatively low numbers of plants present on the only known extant native site, and their presence in a fire prone habitat that has not burned for some time. Additionally, little recruitment has been recorded at the native site and substantial damage to fruit and flowers by insects or a fungus has been observed. Because of the small size of the single known native population, any threat may be considered a range wide threat. The conservation value of the test populations in alleviating these threats is unknown.

Imminence: Threats to *Hazardia orcuttii* are non-imminent (although some are persistent) because the species is a perennial, is now State listed as threatened, and occurs in managed areas. This species is intrinsically vulnerable (in part) because there are so few individuals and few seedlings.

Rationale for Change in Listing Priority Number (insert if appropriate)

yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted?

No, because there are no known range-wide threats that immediately threaten the existence of the species.

DESCRIPTION OF MONITORING

A monitoring report from the CNLM (Spiegelberg, *in litt*. 2004) presents the cumulative data from monitoring *Hazardia orcuttii* in 2003 and 2004. The monitoring consisted of measuring the height and width or the plants, recording those that were dead, and noting the occasional plant with flowers. At MCA, 40 marked plants of the 150 planted in 2003 were measured in January, April, July, and November 2003, as well as February and June 2004. The 24 individuals planted at Kelly Ranch in 2003 were measured in April, July, and November 2003, and in February and June 2004. Forty marked plants of the 100 planted at Kelly Ranch in 2004 were measured in February and June 2004. Forty of the 156 individuals planted at San Elijo Lagoon in 2004 were measured in February and June 2004. Forty of the 200 plants planted at the La Costa site in 2004 were measured in February and June 2004. Only occasionally were flowers noted. Many outplanted individuals, as would be expected, increased in height, and few plants had flowers present.

The reports do not discuss plant sizes, survival, or phenology of the intact native *Hazardia orcutii* population at MCA, although recruitment at the translocated northeastern population at MCA appears to be increasing steadily. No information was provided in the reports regarding any interactions among the newly established occurrences and the original MCA occurrence. The more recent reports (CNLM 2005, 2007a, 2007b) do not provide monitoring details, although CNLM 2007a and 2007b do present recruitment data.

A study initiated by CNLM in the 2007-2008 fiscal year analyzed *Hazardia orcutii* seedlings from transplanted populations monitored by CNLM. The height of each seedling was recorded as well as the distance and azimuth from the closest parent plant to determine if there is a significant relationship between the potential parent plant and location of seedling (CNLM 2009a, p. 8). Results indicate an average height of 10.3 cm (4 in) and an average distance to potential parent plant of 42.7 cm (17 in) for 104 seedlings. Seventy-three percent of all seedlings were clustered around seven obvious parent plants. Sixty-seven percent of 104 seedlings were associated with a northeastern azimuth (CNLM 2009a, p. 8).

Future monitoring of *Hazardia orcutii* should stress determining the nature and extent of recruitment in the native population. Testing the genetic diversity of the native and test populations should be a priority to understand the significance of the test populations to the continued survival of the species. Consideration should also be given to establishing an international seed bank of the United States and Mexican populations.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: None

Indicate which State(s) did not provide any information or comments: California provided no comments.

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PERSONAL COMMUNICATIONS

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ 6.7.2010
Regional Director, Fish and Wildlife Service Date

Concur: _____ Date: October 22, 2010
ACTING
Director, Fish and Wildlife Service

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: April 2010
Conducted by: Susan North

FY 2010, R8 CNOR: Orcutt's Hazardia